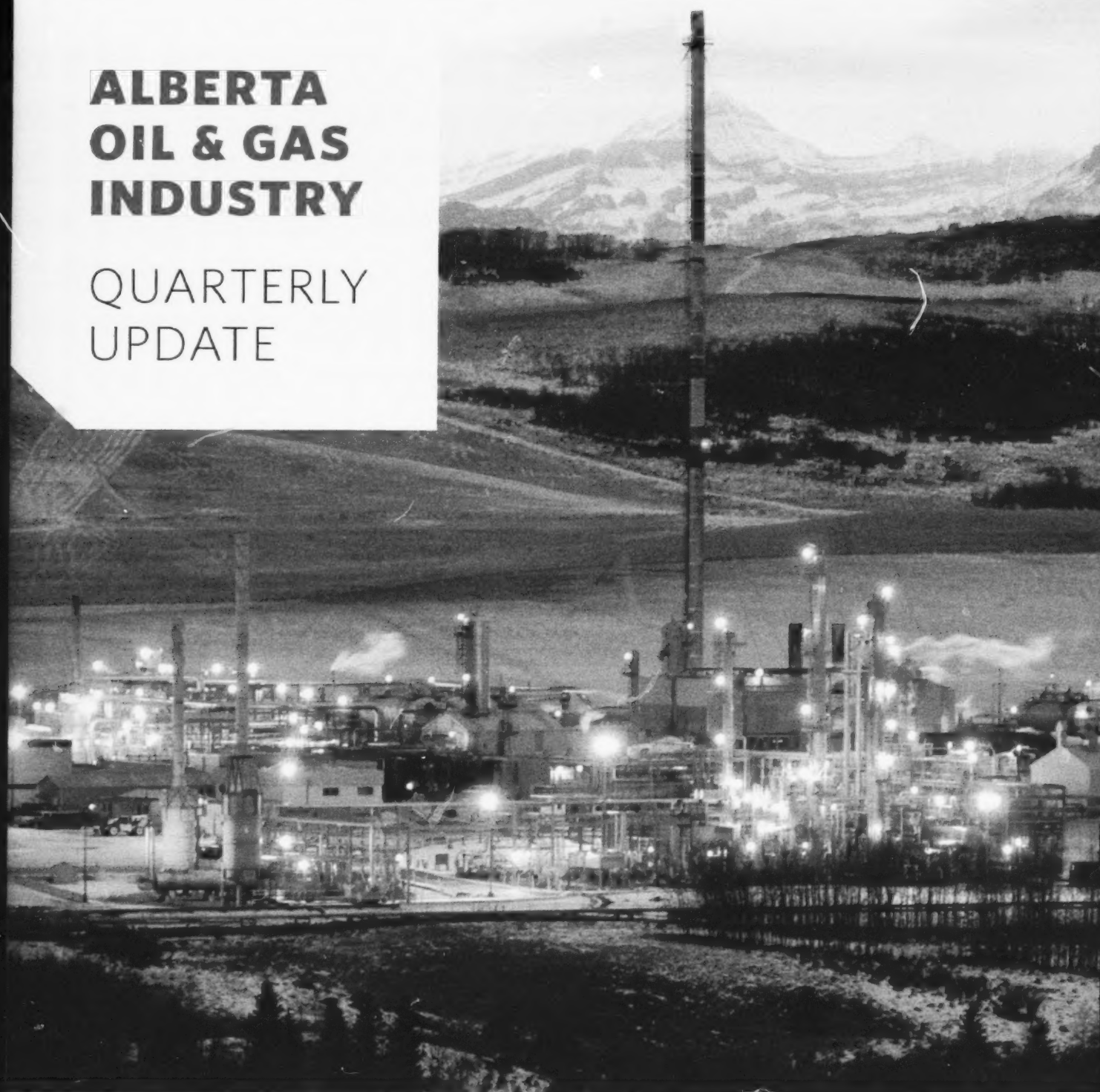


# ALBERTA OIL & GAS INDUSTRY

## QUARTERLY UPDATE



### SPRING 2017

Reporting period:

DECEMBER 5, 2016, TO MARCH 20, 2017

- |                                                   |                                               |
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## ALL ABOUT ALBERTA'S OIL & GAS INDUSTRY

### ABUNDANT: ALBERTA'S CRUDE OIL, NATURAL GAS AND NATURAL GAS LIQUIDS RESOURCES

Alberta's vast crude oil and natural gas resources are the backbone of the provincial economy and a vital element of Canada's economy. In fact, energy development is the largest contributor to the province's gross domestic product, capital investments and exports.

The increased implementation of long horizontal wells and multistage fracturing in tight sand and shale resource plays across the province—not to mention attractive provincial royalty incentives to encourage drilling—have allowed industry to extract crude, natural gas and natural gas liquids (NGLs) from resource bases that had previously been essentially untapped.

In Alberta, the advanced drilling and hydraulic fracturing technology is being used in an increasing number of oil plays. Among the most advanced plays are the Cardium in west-central Alberta and the Viking in east-central Alberta. More importantly, emerging liquids-rich plays like the Montney and the Duvernay continue to show great promise.

Although drilling activity has slowed the past few years because of the weak global commodity price environment, capital spending and drilling activity is slowly picking up in 2017 as prices have modestly rebounded. Many producers continue to report improved results and liquids yields from their Duvernay and Montney programs.

Faced with continued low global crude oil prices and weak natural gas prices, Alberta producers sought additional cost savings and curtailed capital budgets and

activity in 2016. Capital expenditures fell for a second year. Conventional oil and gas wells placed on production dropped by 37.2 per cent in 2016 relative to 2015, and crude oil production and natural gas production declined as a result.

However, some positive news also emerged in 2016. The Canadian government approved two major crude oil pipeline projects: the twinning of the Kinder Morgan Trans Mountain Pipeline to Canada's west coast and the replacement of the Enbridge Line 3 pipeline to the U.S. Midwest. These projects, if completed, will increase Alberta's export capacity, and the Trans Mountain Pipeline will open up market access to Asia.

According to the Alberta Energy Regulator (AER), in 2016, Alberta produced 67 per cent of Canada's natural gas and 81 per cent of Canada's oil and equivalent. More than 60 per cent of Canada's total oil and equivalent production was marketable bitumen.

Conventional crude oil production in 2016 was an estimated 441,000 bbls/d, a decrease of about 16 per cent from 2015 due to lower crude oil prices, which resulted in fewer wells placed on production.

Overall marketable natural gas production in Alberta, which includes growing liquids-rich shale/tight gas volumes, increased for the second year in a row in 2015, growing by 2.2 per cent to 298.6 million cubic metres per day from 292.1 million cubic metres, due to the lag effect from high drilling levels in 2014.

However, in 2016 production of natural gas declined year over year for the first time since 2013, with production estimated to have decreased by 1.8 per cent to 291.9 million cubic metres a day.

Despite the decrease in overall production, production from the Montney and Upper Mannville formations continued to grow, contributing 42 per cent of Alberta's raw natural gas production in 2016, up from 38.2 per cent in 2015. Production gains in these areas were largely associated with new wells placed on production using horizontal multistage fracturing, clearly illustrating the importance of production from these prolific wells.

Raw natural gas as it comes from the wellhead is mostly comprised of methane (the largest constituent of household natural gas), but it also contains various NGLs. Alberta is a major producer of NGLs, which consist of ethane, propane, butanes and pentanes plus.

In 2016, the Alberta government announced a Petrochemicals Diversification Program that will give \$500 million in incentives through royalty credits to new petrochemical facilities in Alberta. To get up and running, these facilities will need certain NGLs as ingredients, or "feedstock."

Alberta is already a leading petrochemical manufacturing province, home to four major ethylene plants with a combined annual production capacity of 8.6 billion pounds. Two of these plants—at Joffre and Fort Saskatchewan—are among the world's largest.

Many investment opportunities exist in Alberta's refining and petrochemical sector, particularly in Alberta's Industrial Heartland, a 589-square-kilometre region northeast of Edmonton that is home to Canada's largest concentration of petrochemical and chemical processors and petroleum refining. ■

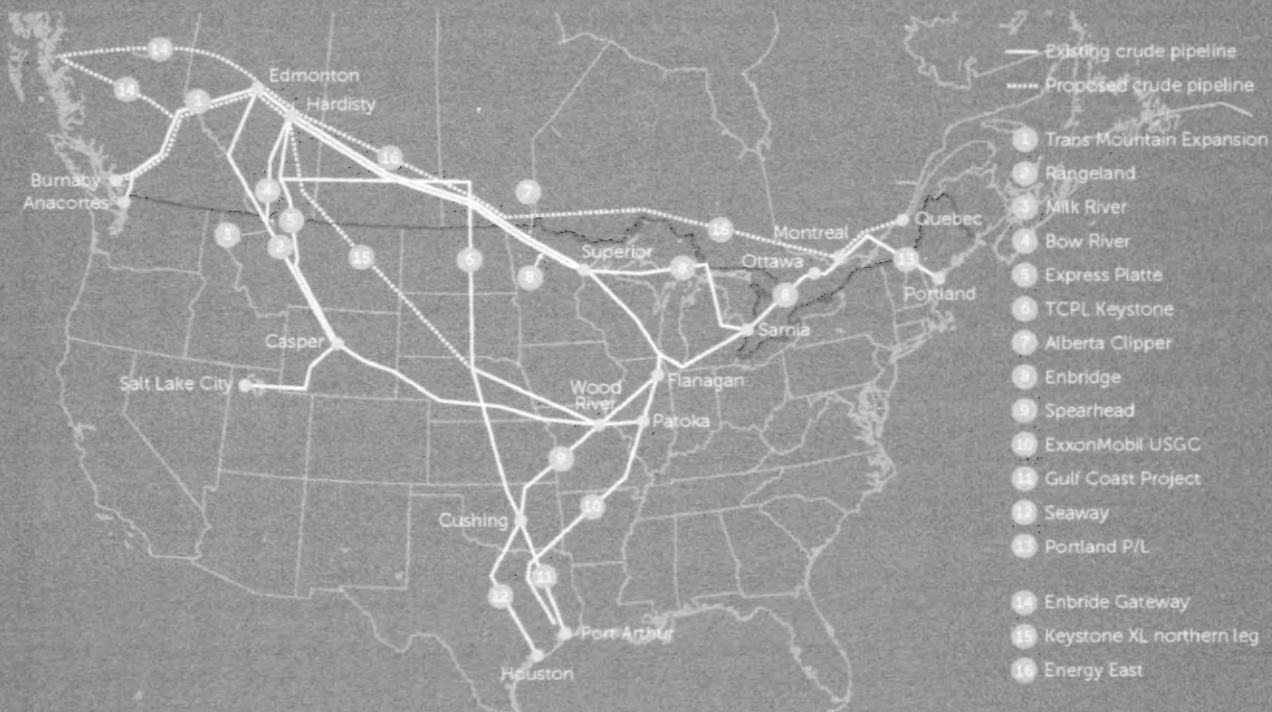
**NOTE:** This publication contains information about Alberta's oil and gas industry, excluding the oil sands. For information on the oil sands, please refer to the *Alberta Oil Sands Industry Quarterly Update* on this [website](#).

Unless otherwise stated, all photos copyright IWN ©2017. Cover photo: Brad Smith

## OIL PLAYS

The Alberta Energy Regulator (AER) estimates that the province has 1.8 billion barrels of remaining established reserves of conventional crude oil, with ultimate potential (recoverable) of 19.7 billion barrels. The remaining established reserves of conventional crude oil in Alberta represent more than one-third of Canada's remaining conventional reserves.

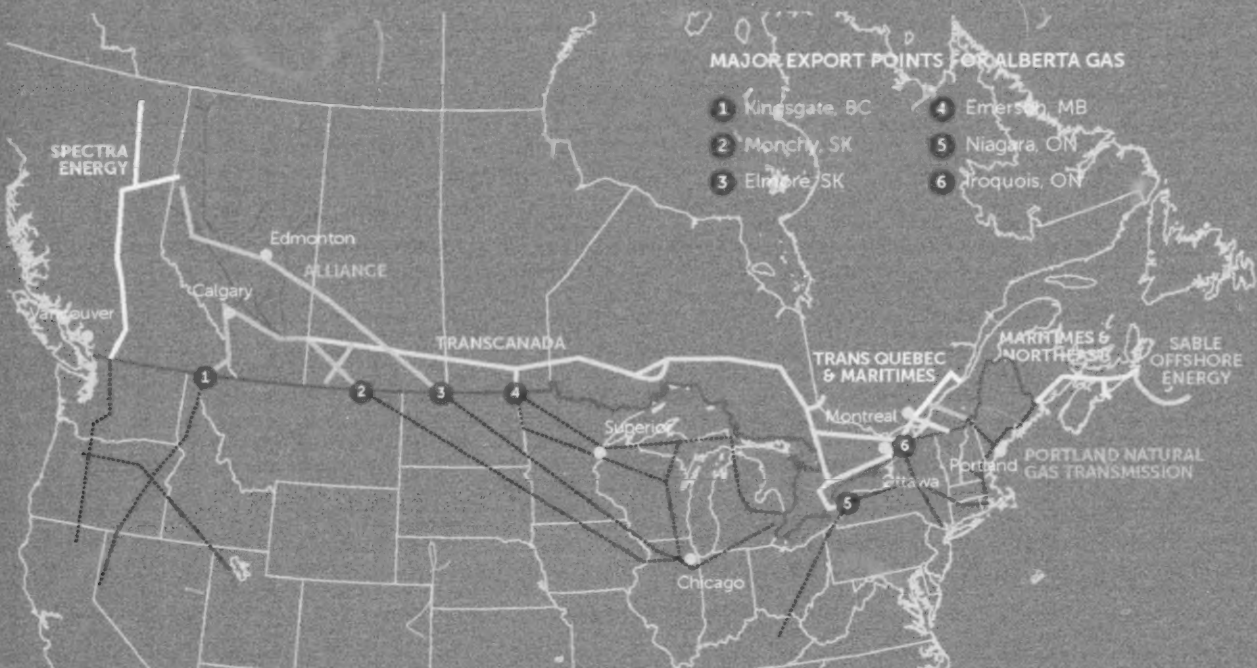
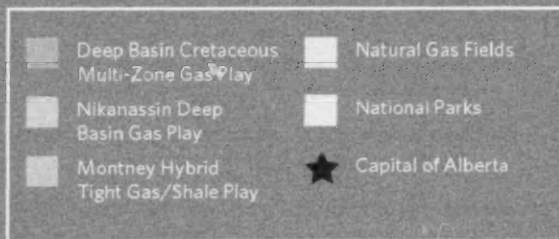
In 1994, based on the geological prospects at that time, the AER estimated the ultimate potential of conventional crude oil to be 19.7 billion barrels. Given recent reserve growth in low-permeability, or tight oil, plays, the AER believes that this estimate may be low.



## NATURAL GAS PLAYS

While the majority of the province's natural gas is still produced from conventional sources, the potential to grow natural gas volumes from coal, shale and tight formations will also be strong contributors going forward.

Alberta has a large natural gas resource base, with remaining established reserves of about 33 tcf and an estimated potential of up to 500 tcf of natural gas from the coal-bed methane resource. In addition, a large-scale resource assessment of shale gas potential in Alberta is underway and could significantly add to the natural gas prospects for the province.



## TOP PLAYS



A MONTNEY PUMP STATION OPERATED BY ENCANAL

Photo: Encana

## MONTNEY CONTINUES ITS GROWTH SPURT

Located in northwestern Alberta and stretching into northeastern British Columbia, the liquids-rich Montney play continues to grow in scope.

So much so that in a presentation on western Canada's Montney formation to a gathering of United States investors, TD Securities' Juan Jarrah pulled few punches in his assessment of the play's future viability and growth potential.

"It's big, it's thick and there's a lot of it," he told The Oil & Gas Conference hosted by EnerCom in Denver, Colo.

"I think [the Montney] is the most important resource play in Canada, definitely, and could be one of the most important in North America, in my opinion," said Jarrah. "It's pretty clear that the Montney can challenge every other play in North America."

In fact, according to Jarrah, the National Energy Board's (NEB's) most recent large-scale study of the Montney's resource potential published in 2013 will undoubtedly prove to be a low-ball assessment.

Using a three per cent porosity cut-off, the NEB estimated a recoverable resource of 449 tcf of natural gas, 14.5 billion bbls of

natural gas liquids and 1.1 billion bbls of oil. With an estimated 4,300 tcf of recoverable natural gas in place, that equates to a recovery factor of about 10 per cent, not including liquids and condensate.

"The key here is that this was 2013. A lot has changed since then," Jarrah said.

"Basically what has happened is we're producing Montney wells horizontally from areas where we thought we would never produce. So that should call into question our entire assumptions here in terms of what kind of porosities we need to use."

After analyzing hundreds of Montney wells, Jarrah and his TD Securities team, working with geologists in Calgary, have mapped the potential gas in place section-by-section and believe that total could rise to more than 5,000 tcf compared to the NEB's initial estimate of 4,300 tcf.

"Our guys in Calgary did the math and said, 'You know what? There's probably 5,000 tcf of gas in place.' And that's again using a three per cent porosity cutoff," he said.

"We've drilled wells in areas where the porosities were close to one per cent and

they've still been productive. Why is that key? That's key because now, going forward, reserves evaluators and people looking at the petrophysics will be more comfortable saying, 'You know what? 5,000 tcf is actually an understatement. It's way bigger than that.' So that story will be continued."

Montney production currently accounts for about 25-33 per cent of Canadian natural gas production of about 15 bcf/d. The way things are going, TD internally thinks that by 2020 it will represent about 50 per cent of Canadian gas production.

Despite continued improvement and the deployment of new completion methods, exploration and production companies active in the Montney will continue to push the envelope by deploying lessons learned in some of the more prolific resource plays south of the border, Jarrah predicted.

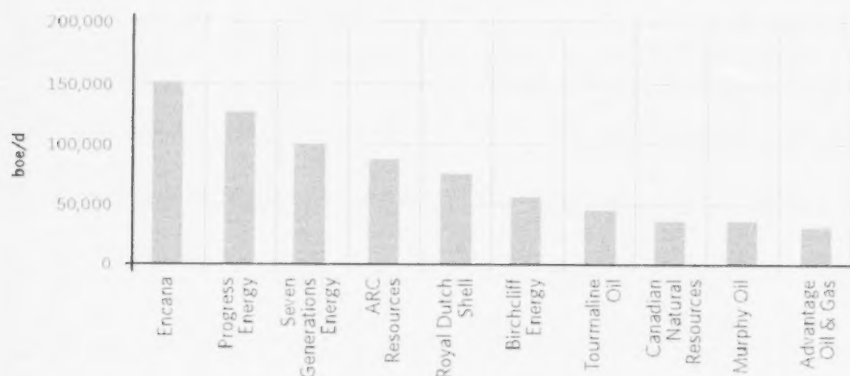
"The reality is I would say we're probably a year behind from a technology perspective relative to some of the completion techniques and well lengths that are being utilized in the U.S.," he said.

"The point here is it has gotten better with time and I expect it will continue to ➤

## TOP PLAYS CONTINUED

## THE KEY PLAYERS

Top 10 Montney operators: gas, oil and C5 production (H1 2016)



Notes: Excludes plant natural gas liquids.  
Pro-forma recent material acquisitions (Encana, Birchcliff and Seven Generations).

get better with time as we continue to drill longer wells and bigger fracs."

Glen Nevokshonoff, senior vice-president, operations, for Seven Generations Energy, said the company continues to make "strong and efficient progress" in drilling and completions operations and production from its Alberta Montney assets.

"What is most important is that evidence for the optimized resource recovery shows that our wells are actually producing above our type curves. We are seeing higher condensate yields from our slickwater [fracs], and it gives us confidence that we're doing the right thing," he said.

"We are improving recovery of hydrocarbons and that's where the additional value is created."

#### ALBERTA MONTNEY ACTIVITY ON THE UPSWING

Here's a snapshot of what some companies are planning for the Alberta Montney in 2017:

- In the Montney in 2016, Encana delivered a 50 per cent well productivity

improvement from a new well by applying a completion design similar to one successfully pioneered in the Eagle Ford. "In the Montney, we have again leveraged our multi-basin advantage by transferring the success we've had in the Eagle Ford in fluid tight cluster design," said Mike McAllister, executive vice-president and chief operating officer. "We implemented this design in Pipestone just 12 weeks after first testing it in the Eagle Ford. Early results are compelling. There's been a 50 per cent improvement in well performance in the first 45 days. Our drilling and completion costs remained flat in the first quarter as operational efficiencies offset increases in completion scope."

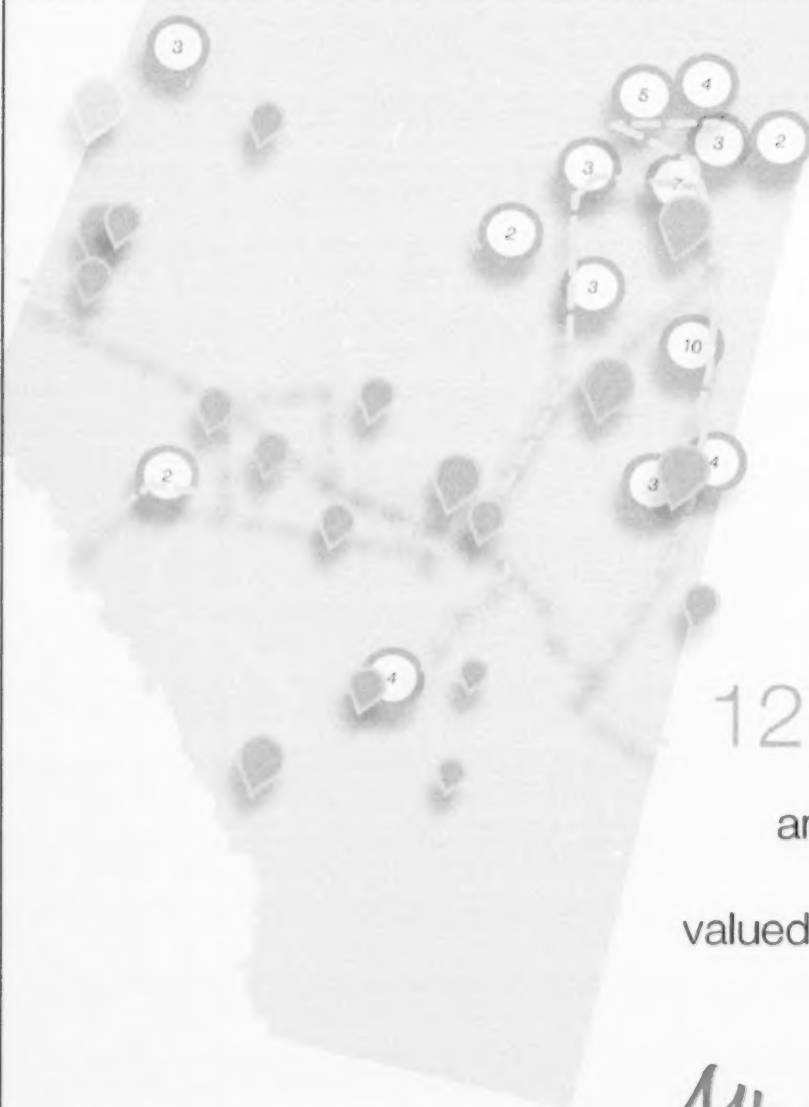
McAllister said the company plans to spend about \$265 million in the Montney this year. He said Encana plans to run seven gross rigs in the play and drill a total of 70-80 net wells. Ten to 12 of these wells will be drilled at Pipestone. Drilling and completion costs are expected to average \$4.5 million per well.

- Seven Generations Energy plans to spend up to \$1.6 billion in 2017, targeting a 50 per cent increase in its Montney production. The spend will include operating an average nine rigs and drilling about 100 wells in its core Nest 2 area in the Alberta Montney. This is an increase from Seven Generations' capital spending in 2016, which is expected to come in at between \$1.05 billion and \$1.1 billion. The 2017 capital program will also include engineering and partial construction of the company's third natural gas processing plant at the north end of the Kakwa field.
- ARC Resources says its planned \$665-million capital spend in 2017 is focused on keeping its core Montney areas at or near capacity in a program weighted to crude oil and liquids-rich natural gas development. The company plans to drill 79 wells across its Montney portfolio next year, including 20 in northwestern Alberta.
- Paramount Resources plans to drill up to 24 and complete up to 12 two-mile Montney wells in northwestern Alberta at Karr-Gold Creek by mid-2017, with the first of the new wells scheduled to be brought on production in the first quarter of 2017. Capital costs to drill, complete and equip these wells are expected to average approximately \$10.5 million.
- Delphi Energy recently announced a \$40-million Montney joint drilling program with an unnamed "existing working-interest industry partner" to speed up development in its liquids-rich natural gas play at Bigstone in northwestern Alberta. The deal will see the drilling of five to six wells before July 15, 2017. ■

majorprojects.alberta.ca

# ALBERTA MAJOR PROJECTS

An inventory of private and public sector projects in Alberta valued at \$5 million or greater



127 oil & gas, pipeline  
and industrial projects  
valued at \$176.9B

*Alberta* Government



Alberta

## Alberta Export Expansion Package

The Government of Alberta is supporting more Alberta companies to export to new international markets with several new programs.

### Ready to export?

If you're looking to explore new business opportunities around the world, we can help. The **Export Support Fund** provides up to \$20,000 to cover costs associated with entering new markets, such as marketing and attending international trade shows.

### Need help deciding?

Set your business up for success with an international market entry strategy. The **Export Readiness Micro-Voucher Program** offers up to \$5,000 in funding for export experts to create your strategy.

### Apply now

For more information on these programs and to apply, visit:  
[jobsplan.alberta.ca](http://jobsplan.alberta.ca)

## WHAT'S NEW IN THE OIL & GAS INDUSTRY

### GOING GLOBAL: NEW REPORT A WELCOME AID FOR EXPORTERS OF OIL AND GAS SERVICES AND TECHNOLOGIES

Oilpatch players in Canada's export market celebrated a new addition to their toolbox in February with the Calgary launch of *Going Global Phase 2*, a guide for Canadian service and technology firms intent on cracking or expanding further into international markets.

Industry executives speaking at the product launch included a representative from report publisher JWN.

"Many of you are starting to look at global markets, but have communicated a need for advice, whether on how you look at market expansions or [what] you need to think about for growth," said Bimal Mehta, JWN's senior vice-president, energy intelligence.

Knowing there are many places worldwide they could market their equipment and services, many company heads have questions about what to consider before leaving Canada and which markets offer the most for their wares.

"The report was proposed as a catalyst for that conversation," Mehta said, noting the report is the second of its kind, following the release of *Going Global Phase 1* in November 2016. The report, Mehta told the audience, is only the first step in their export journey.

"I would never recommend you read it—or the one released in November—and say, 'Hey, I know everything there is to know about exporting,'" he said. "You've got to be able to use it as an intelligence tool that perhaps helps you raise your game or gives you a few considerations to think about as you explore global markets."

The first *Going Global* report focused on six countries: U.S., Argentina, Brazil, Colombia, Mexico and Peru, while the second deals with another 10 countries: Australia, China, Indonesia, Iran, Norway,



Qatar, Russia, Saudi Arabia, the United Arab Emirates and the United Kingdom.

Together, the two reports quantify which of the 16 countries offer the best market opportunities, based on the size and maturity of oil and gas production assets, and how well those assets match up with the Alberta industry's core competencies in heavy oil development, unconventional resource development and enhanced oil recovery.

Another partner in *Going Global Phase 2* was the Alberta government, represented by Tim Hazlett, director of upstream oil and gas services and technologies for the province. "I think the [study] speaks highly to collaboration," he said. "The report is truly a collaborative approach and an important step in helping Alberta and Canadian firms."

### CONVENTIONAL OIL AND GAS SPENDING IN ALBERTA EXPECTED TO RISE IN 2017

Forecasting lower oil sands but higher conventional oil and gas spending, the Alberta Energy Regulator (AER) is predicting industry-wide spending in Alberta will be flat this year.

Releasing its annual reserves and supply outlook in late February, the regulator

forecast total industry spending would rise to just \$26.2 billion this year, barely up from the \$26 billion the AER estimated was spent in 2016. At that, industry-wide spending in Alberta had dropped about 35 per cent last year, from \$39.8 billion in 2015.

Conventional spending in 2016 fell 41 per cent to \$10 billion from \$17 billion in 2015, but is expected to rebound 20 per cent this year, to about \$12 billion, responding to stronger commodity prices and continued activity in the Cardium and Lower Mannville crude oil plays and the Montney and Upper Mannville natural gas plays, the AER said.

Meanwhile, oil sands spending is expected to drop 11.2 per cent to \$14.2 billion in 2017 from about \$16 billion last year, reflecting project deferral, cost cutting and such uncertainties as Alberta's legislated oil sands emissions cap, as well as oil export pipeline capacity additions, the report forecast.

### LABOUR SHORTAGE THREATENS PACE OF SERVICE COMPANIES' ACCELERATION

Based on producers' healthier spending plans, Canada's service and supply companies are expecting to emerge from their worst year in decades to ➤

WHAT'S NEW IN THE **OIL & GAS INDUSTRY** CONTINUED

improved conditions in 2017—if they can get enough workers.

Industry associations, service companies and analysts agree they are seeing signals that the downturn has troughed, but are worried that a labour shortage will keep it in a lower gear.

Over the past two years many oilfield workers, whose hours and pay had withered away, abandoned the industry and western Canada, migrating back to wherever they came from for work in different fields, they are not expected to return.

**Canada's service and supply companies are expecting to emerge from their worst year in decades to improved conditions in 2017—if they can get enough workers.**

"Look for 2017 to be 'déjà vu all over again' as labour becomes a major recurring challenge," said Jon Morrison, executive director of institutional equity research, oilfield services, for CIBC World Markets.

Having enough experienced workers is a growing issue, said Mark Salkeld, president and chief executive officer of the Petroleum Services Association of Canada.

Many companies have retained as many staff they could and kept them working, some of them operating at cost or less in order to do so, he said.

"On a frac spread, you might have four supervisors to two roughnecks, so

to speak, or on a drilling rig, you had three drillers and two tool pushers, but now the rigs are brought up, these guys are going back to their rigs or the frac spreads and [the companies] have to hire new," said Salkeld. "They've put all their people on staff back to work and they have recalled as many as they could and now [they are] hiring brand new—greenhands. They may be coming from a new industry and this is their first taste of oil and gas."

Companies are setting up their own training schools, holding job fairs in areas such as Grande Prairie, on First Nations lands and in eastern Canada, hiring Canadians first, he said.

Service companies' recruitment efforts include raising wages, offering guaranteed hours and providing retention bonuses. Comfortable living accommodations at camps is another attractant.

**OPEN SEASON CONFIRMS STRONG PRODUCER SUPPORT TO MOVE ADDITIONAL WESTERN CANADIAN GAS TO EASTERN MARKETS**

TransCanada Corporation announced the successful conclusion of a long-term, fixed-price open season to transport natural gas on the Canadian Mainline from the Empress receipt point in Alberta to the Dawn hub in southern Ontario. The company said that the successful open season confirms strong support of producers to move additional western Canadian natural gas to eastern markets. The company confirmed that its recent open season resulted in binding, long-term contracts from Western Canada Sedimentary Basin (WCSB) gas producers to transport 1.5 petajoules per day of natural gas at a simplified toll of 77 cents per gigajoule.

"Today, WCSB producers are facing a much more challenging landscape than they have in the past. This new offering helps our customers compete more



Photo: CIBC

effectively by utilizing existing capacity on the Canadian Mainline, and demonstrates the importance and value of this system to deliver their products to markets in eastern Canada and the northeast U.S.," Russ Girling, TransCanada's president and chief executive officer, said March 13.

"This long-term agreement provides significant benefits for our customers, shareholders, communities and governments that depend on the economic benefits that are generated by natural gas exploration, production and transportation," added Girling.

"In addition to utilizing existing capacity and pipelines already in operation, the incremental revenue generated from this offering will make the Canadian Mainline more competitive." ■

## TECHNOLOGY UPDATE

### ALBERTA-BASED COMPANY WINS AWARD FOR MONITORING TECHNOLOGY

An acoustic monitoring technology that puts eyes downhole during fracking operations and a soil remediation technique inspired by a dandelion growing through pavement were declared the winners of the Energy New Venture Competition held in early March.

In all, 12 teams, shortlisted from 69 applicants, competed in the fourth annual contest hosted by the Hunter Centre for Entrepreneurship and Innovation and Innovate Calgary.

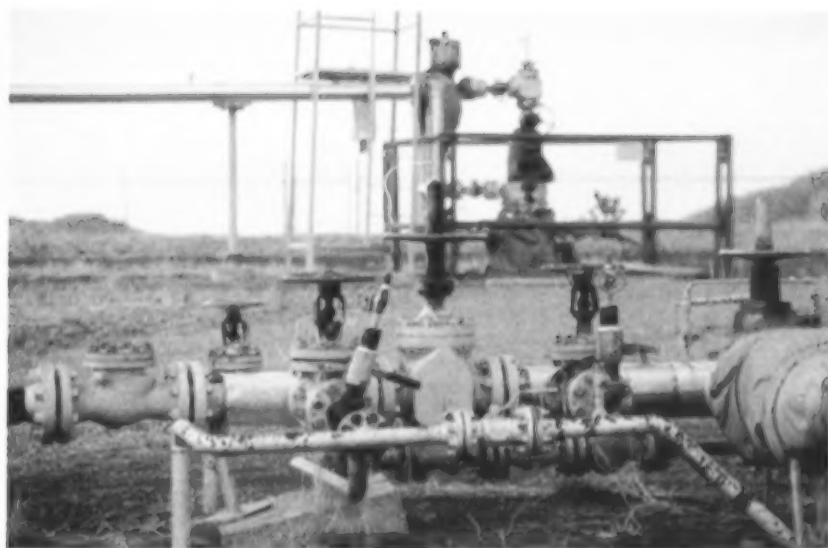
Calgary-based Cold Bore Technology was the Venture Stream winner, awarded with \$25,000 and a pitch at the PROPEL Energy Tech Forum.

Cold Bore initially developed and patented sonic telemetry technology for drilling in 2014, but with the downturn that decimated drilling it turned to monitoring fracs, Brett Chell, Cold Bore's managing director, told some 250 investors, other entrepreneurs and sponsors at the event.

"The fracking industry is blind. There is currently next to no actionable data available for fracking operations. I come from the drilling side of the industry, and they get a tonne of information when they drill wells. This is not true in the fracking industry."

That is despite the fact that the hydraulic fracturing of a well can cost two to three times the cost of drilling the well, Chell said. "It seems a little absurd to me that in the drilling industry we have so many different methods in place to track and observe everything we are doing, while drilling a well and fracking [have] none."

Cold Bore's core technology is acoustic event identification. It uses a series of magnetic sensors to listen to the well and create noise profiles that can identify what is occurring thousands of metres down the pipe. Software developed to cancel out irrelevant noise and to distinguish between different events can alert the operator if the



frac is not going as planned, allowing for troubleshooting of unexpected occurrences in real time.

Sensor data is analyzed on location and a mobile interface instantaneously relays information such as what's happening with each valve's pressure, volume and position. The software generates a terabyte of data a day and generates a report detailing each relevant event during the completion operation.

Cold Bore partnered with GE and built the technology on Predix, GE's industrial cloud-based software platform. GE is now outfitting its entire Canadian frac fleet with the technology, and will open up more opportunities for Cold Bore as it merges with energy services giant Baker Hughes this year, Chell said.

The company, which only commercialized the technology last fall, counts some of Canada's leading producers among its 12 customers, including Canadian Natural Resources, Seven Generations Energy, Crescent Point, and soon Shell Canada and Husky Energy, he said.

### NEW PRODUCTION PLUS SLICKLINE SYSTEM ENHANCES ARTIFICIAL LIFT PERFORMANCE

The Production Plus Energy Services has launched its Horizontal Enhanced Artificial Lift, or HFAL, slickline system designed to provide greater access to the wellbore, easier installation, simpler

integrity testing and an economical protection solution for damaging offset interwellbore communication or frac-hits.

The new HEAL slickline system, part of a set of HEAL system configurations that offers increased efficiency and more cost options, has the flexibility to enhance the performance of any artificial system, including electrical submersible pumps, rod pumping, progressive cavity pumping and plunger lift through the life of a horizontal well, according to the Calgary-based company.

Horizontal wells are known to have production challenges as a result of inconsistent slug flow, damaging solids and excessive gas interference, and production through the life cycle of these wells often requires complex and expensive artificial lift strategies, according to Production Plus Energy Services.

The HEAL system offers a solution to mitigate slug flow that enables fewer, and simpler, artificial lift transitions while lowering production costs. With no moving parts, it easily joins to the horizontal as part of a standard well completion and is designed to perform for the life of the well.

"In the lower-commodity environment, producers are looking for options to help them operate as efficiently as possible. Our expanded technology is tailored to operator risk tolerance, cost environment and well configuration," Jeff Saponja, chief executive officer of Production Plus, said in a statement. ■

## THE ENVIRONMENTAL FILE

### EMISSIONS LEVY DEMANDS IMMEDIATE ACTION, SAYS CARBON CONSULTANT

Alberta-based oil and gas operators can mitigate risks and capitalize on opportunities in an evolving environmental regulatory landscape, but they must collaborate early and often, a recent energy symposium heard.

"When you're looking at the regulatory risk profile for your organization...all of these risks, whether it's NOx, benzene or [greenhouse gas] emissions, [they] are going to be or should be a part of your management strategy around your environmental liability," Jackson Hegland, executive director of the Methane Emissions Leadership Alliance (MELA), told the Canadian Energy Research Institute's annual Oil & Gas Symposium held in Calgary.

MELA provides data, services and solutions for methane emissions management in Canada. Launched in September 2016, the alliance is forming partnerships with government, industry and other key stakeholders, focused on building a clean economy and generating new jobs.

In November 2015, the Alberta government announced Alberta's Climate Leadership Plan, designed to reduce methane emissions by 45 per cent from 2014 levels by 2025.

Alberta's plan includes a carbon levy on all emitting fuels used for transportation and heating. The levy starts at \$20 per tonne in 2017 and increases to \$30 per tonne in 2018.

Hegland urged his audience to begin planning now. "There is a very short timeline to get a handle on this within each

of our organizations. Don't wait. It's a very intense process to go through and understand where your opportunities and risks are, and ultimately, what you're going to do from an actionable perspective and what projects you're going to pursue."

An output-based allocation system for large industrial emitters will be designed to reward top-quartile performance in the sectors to which it applies.

With carbon pricing already in place and an oil and gas methane regulation under development, Alberta's announced policies cover the major emitting sectors in the province.

### CLIMATE ACTION A COMPETITIVE ADVANTAGE FOR ALBERTA AND CANADA, SAYS FEDERAL ENVIRONMENT MINISTER

Federal Environment and Climate Change Minister Catherine McKenna had a simple message for a Calgary business audience May 9: climate action is the competitive advantage to the country.

"This is the opportunity for Canada to be at the forefront in developing cleaner energy, including from the oilsands, and developing new companies in innovating," she said in a noon luncheon speech to the Calgary Chamber of Commerce. "And if there is a place they have to innovate, it is right here in Calgary."

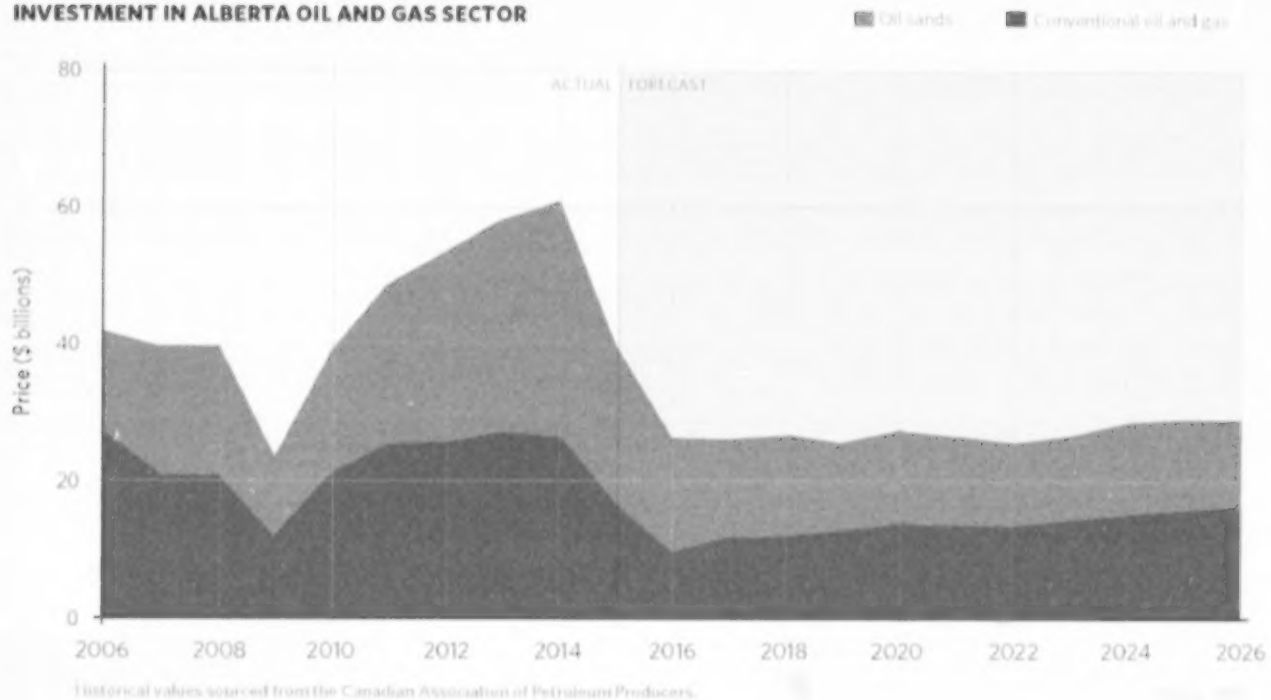
McKenna noted that earlier in the day she had a chance to meet with a diverse group from the energy sector. "Everyone there was all in, everyone was excited, coming with solutions and also looking at how we are working together," she said. "This is the way we are going to move forward. We are going to find thoughtful, practical solutions that provide certainty to business, and the uplift is that in a cleaner direction it creates good jobs and economic opportunity." ■



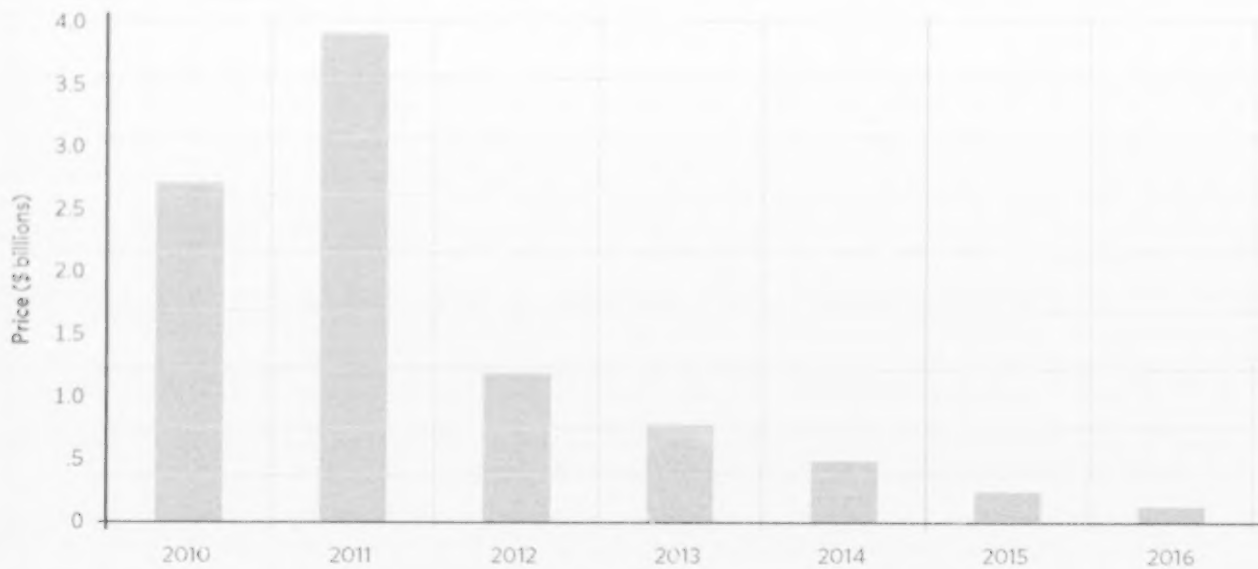
*Photo: Canadian Energy Pipeline Association*

## OIL & GAS STATISTICS

### INVESTMENT IN ALBERTA OIL AND GAS SECTOR



### ALBERTA CROWN LAND SALES Petroleum and natural gas rights, excluding oil sands



**DRILLING RIG COUNT BY PROVINCE/TERRITORY**

Feb. 28, 2017

|                  | ACTIVE     | DOWN       | TOTAL      | ACTIVE              |
|------------------|------------|------------|------------|---------------------|
| Western Canada   |            |            |            | (Per cent of total) |
| Alberta          | 223        | 228        | 451        | 49                  |
| British Columbia | 35         | 31         | 66         | 53                  |
| Manitoba         | 7          | 3          | 10         | 70                  |
| Saskatchewan     | 76         | 39         | 115        | 66                  |
| <b>WC total</b>  | <b>341</b> | <b>301</b> | <b>642</b> | <b>53</b>           |

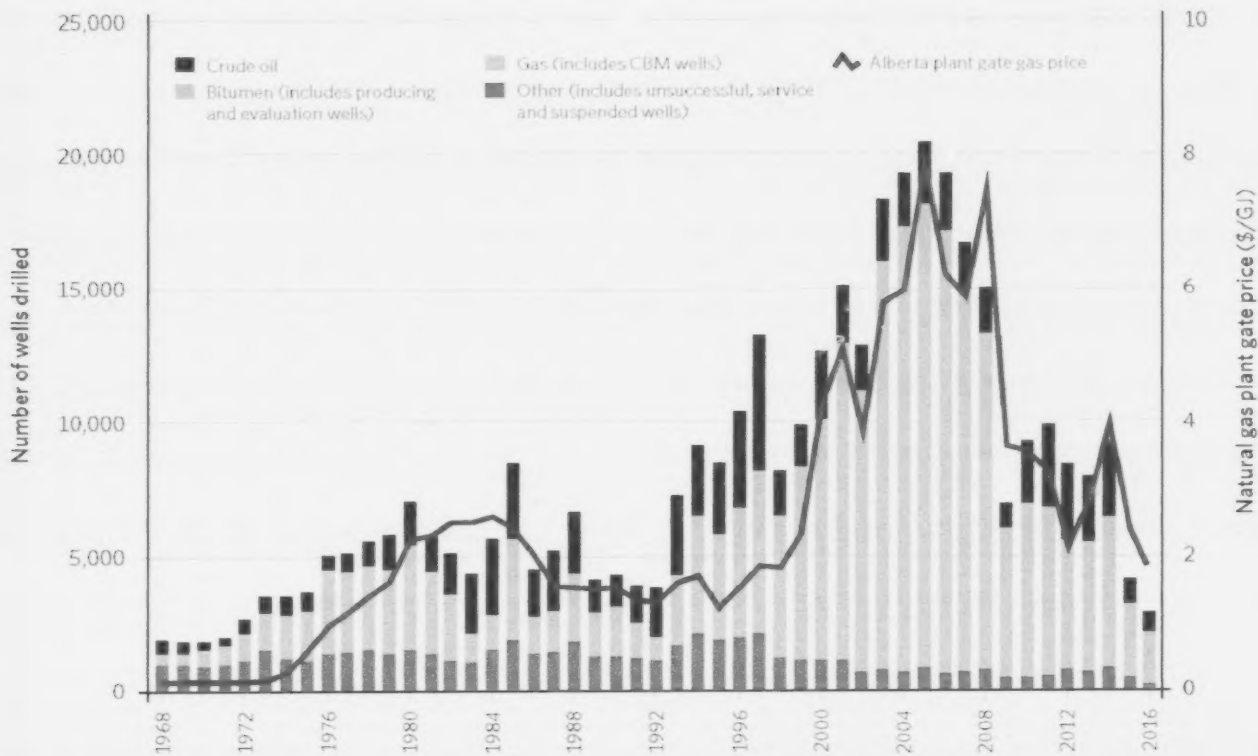
Source: WEA

**OIL AND GAS WELL COMPLETIONS BY PROVINCE**

February 2017

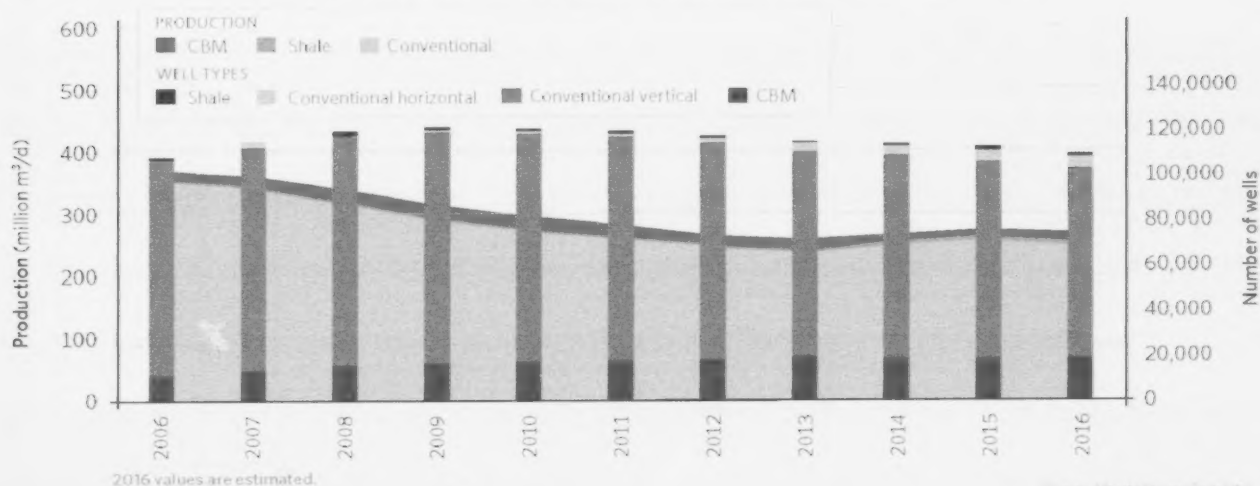
|                  | OIL WELLS  |            | GAS WELLS  |           |
|------------------|------------|------------|------------|-----------|
| Western Canada   | Feb '16    | Feb '17    | Feb '16    | Feb '17   |
| Alberta          | 105        | 129        | 91         | 67        |
| British Columbia | 1          | 0          | 28         | 8         |
| Manitoba         | 20         | 17         | 0          | 0         |
| Saskatchewan     | 0          | 189        | 0          | 0         |
| <b>WC total</b>  | <b>126</b> | <b>335</b> | <b>119</b> | <b>75</b> |

Source: WEA

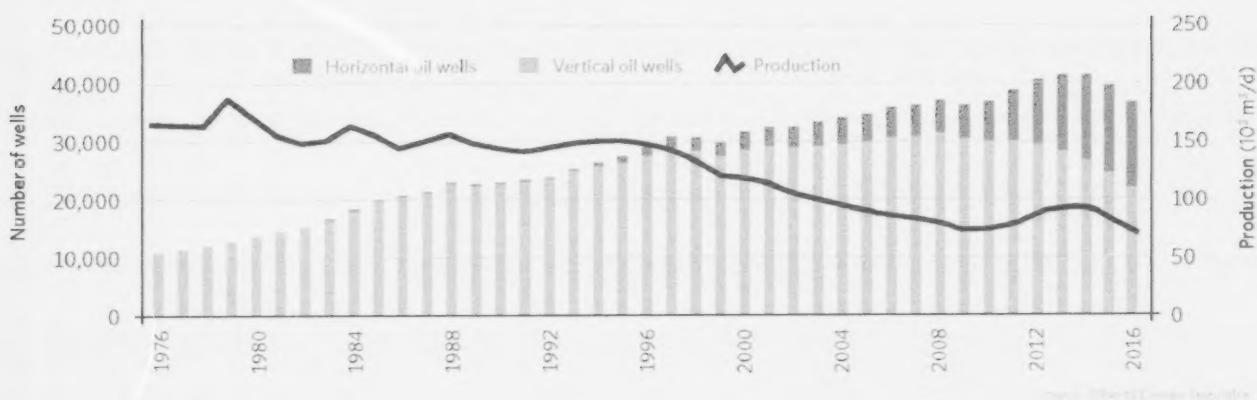
**DRILLING ACTIVITY IN ALBERTA, 1968-2016**

Source: Alberta Energy Regulator

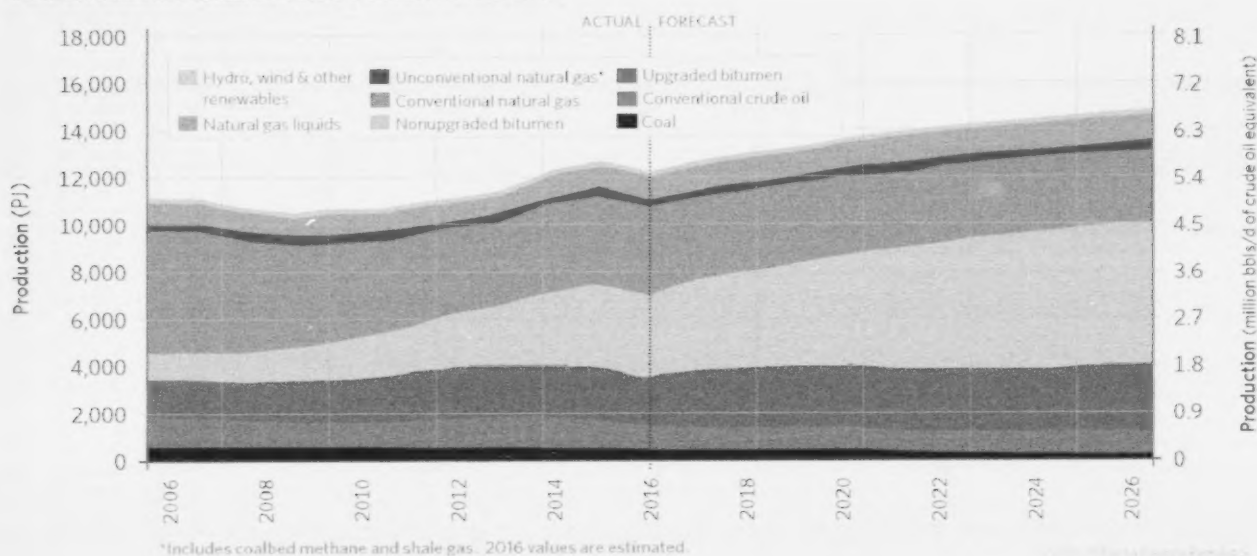
## ALBERTA MARKETABLE GAS AVERAGE DAILY PRODUCTION AND PRODUCING WELLS



## ALBERTA CRUDE OIL PRODUCTION AND PRODUCING WELLS

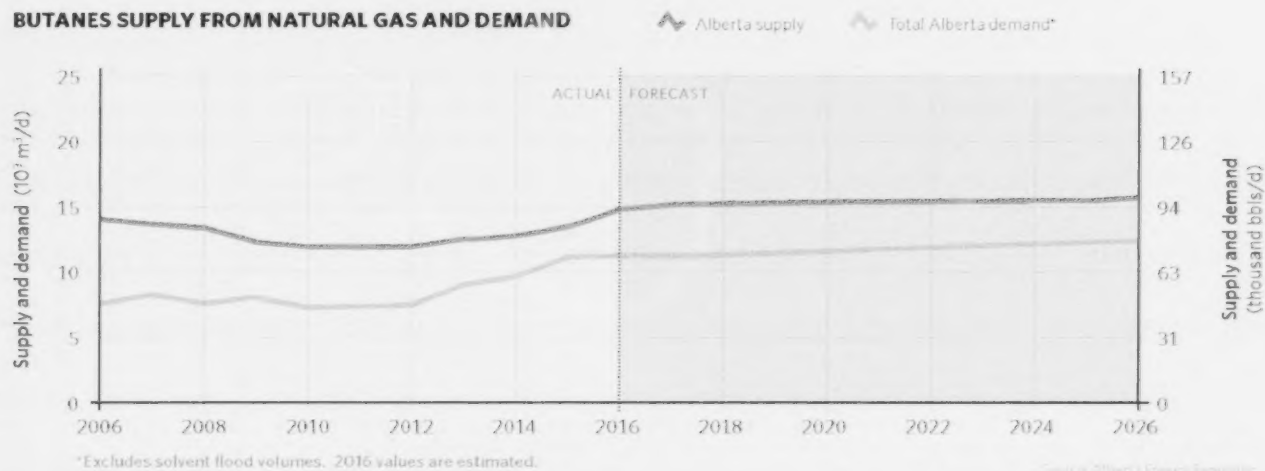


## TOTAL PRIMARY ENERGY PRODUCTION IN ALBERTA

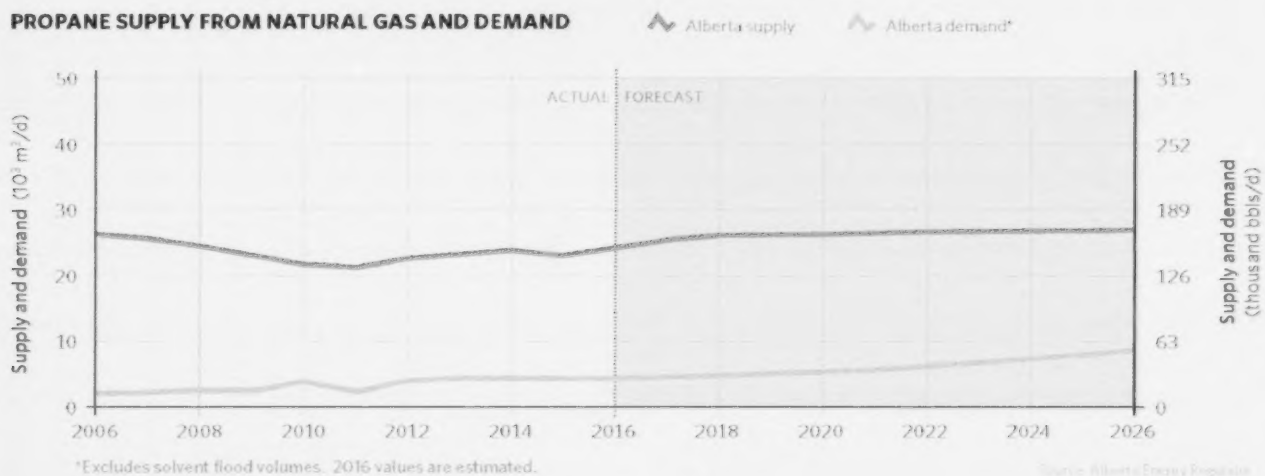


# NATURAL GAS LIQUIDS STATISTICS

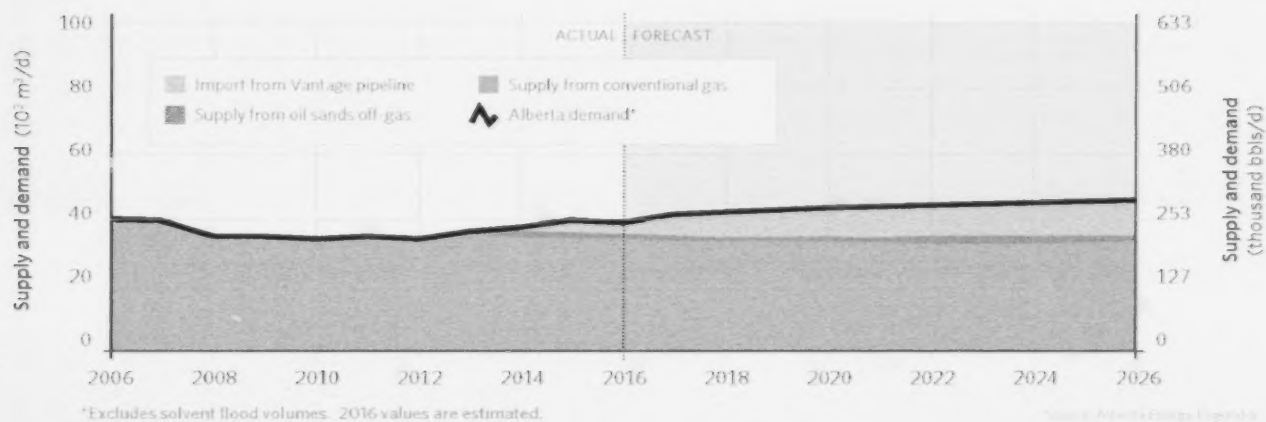
## BUTANES SUPPLY FROM NATURAL GAS AND DEMAND



## PROPANE SUPPLY FROM NATURAL GAS AND DEMAND



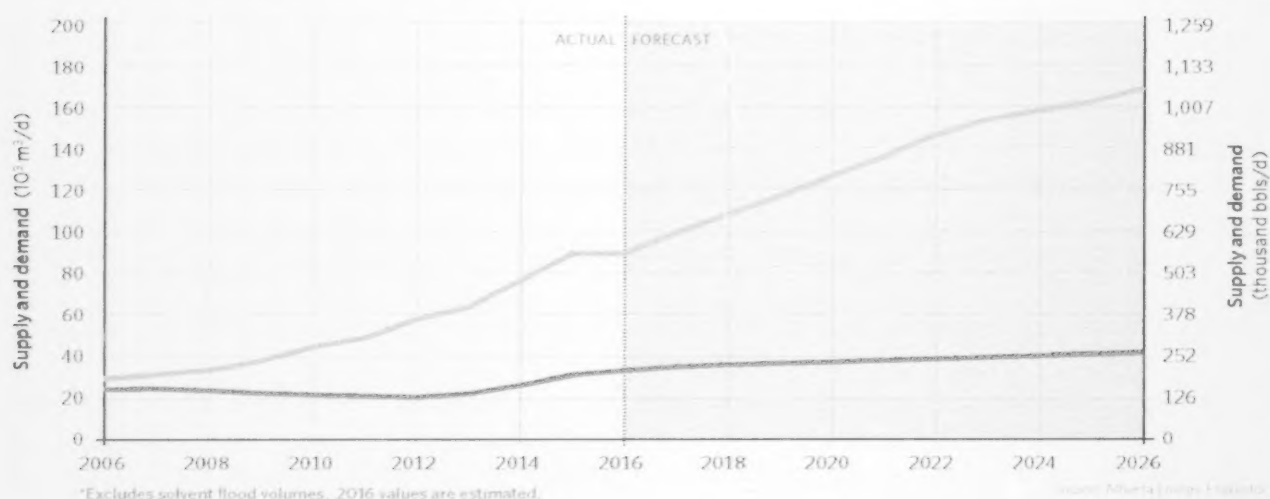
## ETHANE SUPPLY AND DEMAND



## PENTANES PLUS SUPPLY FROM NATURAL GAS AND DEMAND FOR DILUENT

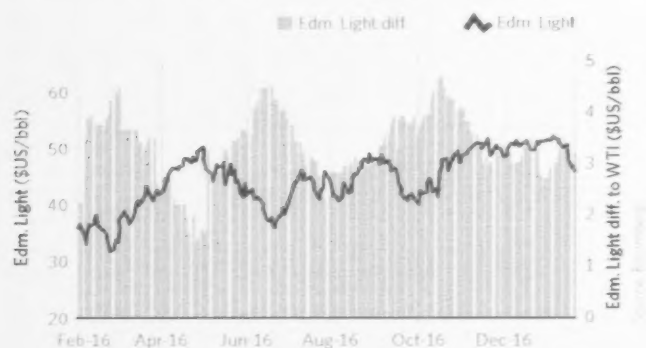
Alberta supply

Alberta demand\*



## CANADIAN LIGHT CRUDE OIL PRICE DIFFERENTIAL TO WTI

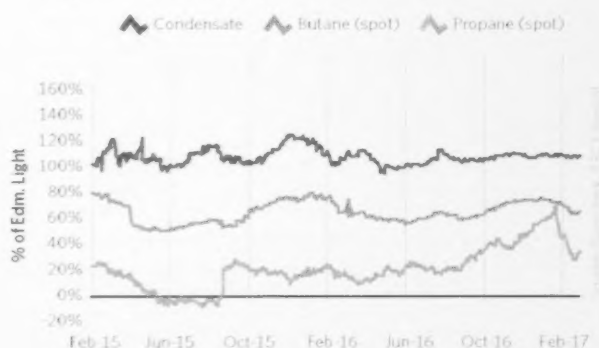
WTI and Edmonton Light differential; rolling 12-month history



The differential should reflect the transportation cost from Alberta to Cushing. Greater discounts can result from infrastructure or refinery outages.

## DAILY NGL PRICES AS A % OF EDMONTON LIGHT

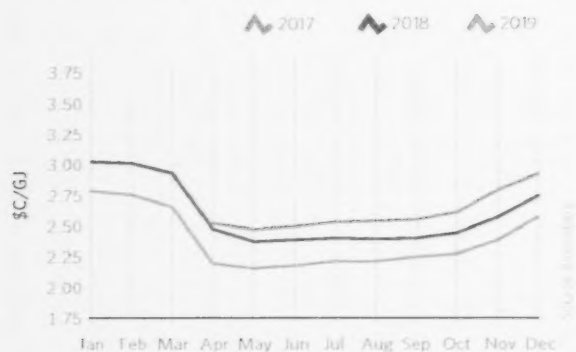
Propane and butane spot prices at Edmonton, AB



Natural gas liquids have become critical contributors to producer's cash flow. Prices are influenced by the price of oil as well as local supply and demand.

## CANADIAN NATURAL GAS FUTURES

AECO Hub (Bloomberg estimate) 2017-19



AECO forward prices mimic Henry Hub futures plus a differential.

## PIPELINE FLOWS OUT OF WESTERN CANADA

Daily; historical tracks and current year levels



The ability of gas producers to move gas out of the WCSB to eastern markets and the U.S. is a major factor in local natural gas prices.

## CONTACTS

### ALBERTA GOVERNMENT

Alberta Advanced Education  
[www.iae.alberta.ca](http://www.iae.alberta.ca)

Alberta Energy  
[www.energy.alberta.ca](http://www.energy.alberta.ca)

Alberta Energy Regulator  
[www.aer.ca](http://www.aer.ca)

Alberta Environment and Parks  
[www.aep.alberta.ca](http://www.aep.alberta.ca)

Alberta Geological Survey  
[www.ags.aer.ca](http://www.ags.aer.ca)

Alberta Innovates  
[www.albertainnovates.ca](http://www.albertainnovates.ca)

Alberta Surface Rights Board  
[www.surfacerights.alberta.ca](http://www.surfacerights.alberta.ca)

### INDUSTRY ASSOCIATIONS

Alberta Land Surveyors' Association  
[www.alsa.ab.ca](http://www.alsa.ab.ca)

Canada's Natural Gas  
[www.canadasnaturalgas.ca](http://www.canadasnaturalgas.ca)

Canadian Association of Geophysical Contractors  
[www.cagc.ca](http://www.cagc.ca)

Canadian Association of Oilwell Drilling Contractors  
[www.caodc.ca](http://www.caodc.ca)

Canadian Association of Petroleum Producers  
[www.capp.ca](http://www.capp.ca)

Canadian Energy Pipeline Association  
[www.cepa.com](http://www.cepa.com)

Canadian Natural Gas Vehicle Alliance  
[www.cngva.org](http://www.cngva.org)

Canadian Society for Unconventional Resources  
[www.csur.com](http://www.csur.com)

Canadian Society of Exploration Geophysicists  
[www.cseg.ca](http://www.cseg.ca)

Canadian Society of Petroleum Engineers  
[www.speca.ca](http://www.speca.ca)

Explorers and Producers Association of Canada  
[www.explorersandproducers.ca](http://www.explorersandproducers.ca)

Gas Processing Association of Canada  
[www.gpacanada.com](http://www.gpacanada.com)

Petroleum Services Association of Canada  
[www.psac.ca](http://www.psac.ca)

Petroleum Technology Alliance Canada  
[www.ptac.org](http://www.ptac.org)

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